

10/585440  
SAP20 Rec'd PCT/PTO 06 JUL 2006

SEQUENCE LISTING

<110> Johnson, Karl F.  
Bezila, Dan  
Ngo, Winnie  
Hakes, David

<120> VECTORS FOR RECOMBINANT PROTEIN  
EXPRESSION IN E. COLI

<130> 019957-020210US

<150> PCT/US2005/00302

<151> 2005-01-06

<150> US 60/535,263  
<151> 2004-01-09

<160> 13

<170> FastSEQ for Windows Version 4.0

<210> 1  
<211> 5039  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Custom DNA vector

<400> 1

gcatcggtt gtcacgctcg tcgttggta tggtttattt cagctccgggt tcccaacgat 60  
caaggcgagt tacatgatcc cccatgttgt gcaaaaaagc ggttagctcc ttccggtcctc 120  
cgatcggggg gggggggaaa gccacgttgt gtctcaaaat ctctgatgtt acattgcaca 180  
agataaaaat atatcatcat gaacaataaa actgtctgt tacataaaaca gtaataacaag 240  
gggtgtttagt agccatattc aacgggaaac gtcttgcgtcc agggccggat taaattccaa 300  
catggatgtt gatttataatg ggtataaaatg ggctcgcgat aatgtcggtc aatcagggtgc 360  
gacaatctat cgactgtatg ggaagcccgat tgcggccagag ttgtttctga aacatggcaa 420  
aggttagcgtt gccaaatgtatg ttacagatga gatggtcaga ctaaaactggc tgacggaaatt 480  
tatgcctctt ccgaccatca agcattttt ccgtacttctt gatgatgtcat ggttactcac 540  
caactgcgatc cccggggaaaa cagcattcca ggtatttagaa gaatatcctg attcagggtga 600  
aaatatttgtt gatgcgcgtt cagttttctt gcggccgggtt cattcgattt ctgtttgtaa 660  
ttgtccctttt aacagcgtatc gcgtatttttgc tctcgctcag ggcgaatcacaatgaaataa 720  
cggtttgggtt gatgcgcgtt attttgcgtt cggcgtaat ggctggcctg ttgaacaagtt 780  
ctggaaagaaa atgcataatgc tatttgcattt ctcaccggat tcagtcgtca ctcatgggtga 840  
tttctcaattt gataaacctt tttttgcacgc gggaaaattt atagggttgc ttgatgttgg 900  
acgagtcgga atcgcagacc gataccagga tcttgcattt ctttgcattt ctatggaaactt gcctcggtga 960  
gttttctctt tcatttacaga aacggctttt tcaaaaatattt ggttatttgcattt atcctgtat 1020  
gaataaaattt cagtttattt tgatgcgttgc tgatgttttca taaagtacta ctcttcctt 1080  
ttcaatattttt ttgaagcattt tatcagggtt attgtctcat gacggatatac atatttgcattt 1140  
gtatatttagaa aaataaaacaa atagggggtt cgcgcacattt tccccggaaaa gtgccacactt 1200  
acgatgaaat ttgtaaacgtt aatattttttt taaaatttgcgtt gttaaatttt ttgtaaatca 1260  
gctcattttt taaccaatag gcccggaaatcg gcaaaaatccc ttataaaatca aaagaatagc 1320  
cccgagatagg gttgagttt gttcccgatgg ggaacaagag tccactattt aagaacgtgg 1380  
actccaaacgtt caaaggccgat gaaaaccgtt atcaggccgtt tggcccaactt cgtgaaccat 1440  
caccggaaatc aagtttttgc ggggtcgaggtt gcccgtttaaagc tcttaatcggtt aaccctaaag 1500  
ggagccccccg atttagagct tgacggggaa agccggcgaa cgtggcgaga aaggaaggaa 1560  
agaaaagcgaa aggagccgggc gcttagggcgat tggcaagtgtt agcggtcacg ctgcgcgtta 1620  
ccaccacacc cggccggctt aatgcgcgcgat tacaggccgtt gttactatggt ttgtttgcgtt 1680

catcgctcaa gaaaccatta ttatcatgac attaacctat aaaaataggc gtatcacgag 1740  
gcccttcgt cttcaagcag atctgaaaaa aaagcccgct cattaggcgg gctcagatct 1800  
gctcatgtt gacagcttat catcgatgtc gacggtaccg aattcctcga gtctagaag 1860  
cttgagctcg gatccatat gacctctaa gcatcgatgg atcctgttc ctgtgtgaaa 1920  
ttgttatccg ctcacaattc cacacattat acgagccat gattaattgt caacaggggg 1980  
atggggagta agctgatcct gtttcctgtg tgaattgtt atccgctcac aattccacac 2040  
attatacggc ccgatgatta attgtcaaca gggggatggg gagtaagctc atcgatggat 2100  
cgatcctgtt tcctgtgtga aattgttacg cgctcacaat tccacacatt atacgagccg 2160  
gaagcataaa gtgtaaagcc tggggtgccct aatgagttag ctaacttaca ttaattgcgt 2220  
tgcgctcaact gcccgtttc cagtcggaa acctgtcgtg ccaggacacc atcgaatgt 2280  
gcaaaaacctt tcgcggatg gcatgatagc gcccggaaaga gagtcattc agggtggta 2340  
atgtgaaacc agtaacgtta tacgatgtcg cagagtagtc cggtgtctct tatcagaccc 2400  
tttcccgctg ggtgaaccag gccagccacg tttctgcgaa aacgcggaa aaagtggaa 2460  
cggcgatggc ggagctgaat tacattcca acccgctggc acaacaactg gcccccaac 2520  
agtgcgttgc gattggcggt gcccacccca gtctggccct gcacgcgcg tcgcaattt 2580  
tcgcggcgat taaatctcgcc gccgatcaac tgggtgccag cgtgggtgg tcgatggtag 2640  
aacgaagcgg cgtcgaagcc tggtaaagcgg cggtgcacaa tttctcgcc caacgcgtca 2700  
gtgggctgat cattaactat ccgctggatg accaggatgc cattgcgtg gaagctgcct 2760  
gcactaatgt tccggcgtt tttcttgcgt tctctgacca gacaccatc aacagtattt 2820  
ttttctccca tgaagacggt acgcgactgg gcgtggagca tctggtcga ttgggtcacc 2880  
agcaaattcg gctgttagcg gcccattaa gttctgtctc ggcgcgtctg cgtctggctg 2940  
gtggcataaa atatctcaact cgcattttttt ttcaagccat gtcggggatc agcggaaacgg 3000  
ggagtgcatt gtccggttttt caacaaacca tgcaatgtctt gatatggggc atcggttccca 3060  
ctgcgtatgcg gttgccaac gatcagatgg cgctggcgcc aatgcgcgc attaccgagt 3120  
ccgggctgcg cgttggcg gatattctcg tagtgggata cgacgatacc gaagacagct 3180  
catgttataat cccggcgtt accaccatca aacaggattt tgcctgtc gggcaaaacca 3240  
gcgtggaccg ctgcgtccaa ctctctcagg gcccaggcggt gaagggaat cagctgttg 3300  
ccgtctcaact ggtgaaaaga aaaaccaccc tggcgcccaa tacgcaaaacc gcctctccca 3360  
gcgcgttggc cgattcatta atgcagctgg cacgacaggt ttcccgactg gaaagcggc 3420  
agtgcgcga acgcaattaa tggtaatgtt ctcaacttaccat aggaccccca gcgtttacac 3480  
tttatgcgttcc cggctcgat ggcgttccgg tgatgacggt gaaaacctt gacacatgca 3540  
gctcccgag acggtcacag cttgtctgtt aacggatgcc gggagcagac aagccgtca 3600  
gggcgcgtca gcgggtgttgc ggggtgtcg gggcgccagcc atgaccatgcg cactgtacg 3660  
tagcggagtg tatactggcgt taaacttcgcg gcatcagacg agatgttact gagagtgcac 3720  
cattatgcgg tggtaaatac cgacacatgcg cgttaaggaga aaataccgca tcaggcgctc 3780  
ttccgcgttcc tcgctcaactg actcgctgcg ctggctcgat gggataacg caggaaagaa 3840  
agctcaactca aaggcggtaa tacgggttac cacagaatca gggccgcgt tgctggcgtt 3900  
catgtgagca aaaggccagc aaaaggccag gaaccgtaaa aaggccgcgt tgctggcgtt 3960  
tttccatagg ctccggccccc ctgacgagca tcacaaaaat cgacgctcaa gtcagagggt 4020  
gcgaaaccgg acaggactat aaagatacca ggcgtttccc cctggaaatg ccctcggtcg 4080  
ctctcctgtt ccgaccctgc cgcttaccgg atacctgtcc gccttctcc cttcgggaaag 4140  
cggtgcgtt tctcatagct cacgctgttag gtatctcaactg tgggttgcgtc 4200  
caagctggc tgggtgcacg aaccccccgt tcagccgcac cgctgcgcct tatccggtaa 4260  
ctatcgctt ggttccaaacc cggttaagaca cgacttacatcg ccactggcag cagccactgg 4320  
taaaggattt acgagagcga ggtatgttagg cggtgttaca gagttcttgcg aatgggtggcc 4380  
taactacggc tacactagaa ggacagttt tggatctgc gctctgtca agccagttac 4440  
cttcggaaaaa agagttggta gctcttgcgtt cggcaacaaa accaccgcgt gtagcgggtgg 4500  
ttttttgtt tgcaagcgcg agattacgcg cagaaaaaaa ggtatctcaag aagatccctt 4560  
gatctttctt acgggggtctg acgctcaactg gaaacggaaac tcacgttcaag ggattttgtt 4620  
catgagatta tcaaaaagga tcttcacca gatcccttta aattaaaaat gaagttttaa 4680  
atcaatctaa agtatataatg agttaaacttgc gtcgtacatc taccatgtt taatcgtga 4740  
ggcacctatc tcagcgatct gtcatttcg ttcattccata gttgcgttgc tcccgctgt 4800  
gtagataact acgataacggg agggcttacc atctggcccc agtgcgttcaat tgataccgcg 4860  
agacccacgc tcaccggcgtt cagatttac agaataaaac cagccagccg gaagggccga 4920  
gcccggatgtt ggtccgtcaat ctttatccgc ctccatccag tctattaaattt gttgcgggg 4980  
agctagatgttcaacttgcg cagttatag tttgcgttgcac gttgttgcgttgc 5039

<210> 2  
<211> 5039

<212> DNA

<213> Artificial Sequence

<220>

<223> Custom DNA vector

<400> 2

gcacgtgg tgcacgctcg tcgtttggta tggcttcatt cagctccgg tcccaacgat 60  
caaggcgagt tacatgatcc cccatgtgt gaaaaaaagc gtttagctcc ttccgtcctc 120  
cgatcgggggg gggggggaaa gccacgtgt gtctaaaat ctctgatgtt acattgcaca 180  
agataaaaat atatcatcat gaacaataaa actgtctgct tacataaaaca gtaataacaag 240  
gggtgtttagt agccatattc aacgggaaac gtcttgctcc aggccgcgat taaattccaa 300  
catggatgct gatttatatg ggtataaatg ggctcgcgat aatgtcggc aatcagggtc 360  
gacaatctat cgactgtatg ggaagccga tgccgcagag ttgttctga aacatggcaa 420  
aggttagcggt gccaatgatg ttacagatga gatggtcaga ctaaactggc tgacggaaatt 480  
tatgcctctt ccgaccatca agcattttat ccgtactcct gatgatgcat gtttactcac 540  
caactgcgatc cccggggaaa cagcattcca ggtattagaa gaatatcctg attcagggtga 600  
aaatattgtt gatgcgctgg cagtgttctt gcggccgggtt cattcgattc ctgtttgtaa 660  
ttgtcctttt aacagcgatc gcgtatttcg tctcgctcag ggcgaatcac gaatgaataa 720  
cggttgggtt gatgcgagtg attttgcgtt cggcgtaat ggctggcctg ttgaacaagt 780  
ctggaaagaa atgcataaagc tattgcatt ctcaccggat tcagtcgtca ctcatgggtga 840  
tttctcaact gataaacctt ttttgcga gggaaattt ataggttgcgtt ttgatgttgg 900  
acgagtcgga atcgcagacc gataccagga tcttgccatc ctttgcgtt ctttgcgtt 960  
gttttctcct tcattacaga aacggctttt tcaaaaatattt ggttattgtt atcctgtat 1020  
gaataaaattt cagtttgcatt tgatgcgtca tgatgttttca taaagtacta ctcttcctt 1080  
ttcaatattt ttgaagcatt tatcagggtt attgtctcat gagcggatac atatttgaat 1140  
gtatttagaa aaataaaacaa ataggggttc cgccgcacatt tccccggaaa gtgccacctg 1200  
acgatgaat tggtaaacgtt aatattttgt taaaatttcg gttaaatattt tttttttttt 1260  
gtcttgcattt taaccatag gccgaaatcg gaaaaatccc ttaaaatca aaaaataggc 1320  
ccgagatagg gttgagttt gttccagttt ggaacaagag tccactatta aagaacgtgg 1380  
actccaaacgt caaaggcgaa aaaaccgtt atcaggcgaa tggcccaacta cgtgaaccat 1440  
caccggaaatc aagtttttttgg ggtcgaggt gccgtaaagc tctaaatcg ggggggggg 1500  
ggagcccccg atttagagct tgacggggaa agccggcgaa cgtggcgaga aaggggggg 1560  
agaaagcgaa aggagcgccc gcttagggcg tggcaagttt acgggtcactc ctgcgcgtt 1620  
ccaccacacc cgccgcgcgtt aatgcgcgcg tacaggcgca gtactatgtt tgctttgcgt 1680  
catcgcttaa gaaaccattt ttatcatgac attaaccat taaaataggc gtatcaccgg 1740  
gccccttcgtt cttcaagcgtt atctgaaaaaa aaagccgcgtt cattaggcg gctcggatct 1800  
gtctcatgtttt gacagctt catcgatgtc gacgggtaccg aattccctcgaa gtcttagaaag 1860  
cttgagctcg gatcccatat gacccatcaa gcatcgatag atcctgttttctt ctgtgtgaaa 1920  
ttgttatccg ctcacaattt cacatattt acgagccgtt gattaattttt caacaggggg 1980  
atggggagta agctgatcct gtttctgtt tgaaattttt atccgcgtcac aattcccacac 2040  
attatacggc cccatgttattt attgtcaaca gggggatggg gagaatgttcc atcgatggat 2100  
cgatccgtt tcctgtgtt aattgttattt cgttcacat tccacacattt atacgagccg 2160  
gaagcataaa gtttaaaagcc tgggggtccat aatgagtttgcgtt ctaacttaca ttaattgcgt 2220  
tgccgtcact gcccgtttt cagtcggggaa acctgtcgat ccaggacacc atcgatgtt 2280  
gcaaaaaccc tccgcgttgcgtt gcatgtatgc gcccggaa gagaatgttcc aggggtggta 2340  
atgtgaaacc agtaacgtt tacgtatgtc cagagtatgc cgggtgtctt tattcgaccc 2400  
tttcccggtt ggtgaaccag gcccggccat tttctgtgtt aacggggggaa aaagttggaa 2460  
cgccgtatggc ggagctgtat tacattccca acccgctggc acaacaactg gccggcaac 2520  
atcgatgttgcgtt gtttccgtt gtttccgtt gtttccgtt gtttccgtt gtttccgtt 2580  
tcgcggcgat taaaatctcgcc gccgatcaac tgggtggccat cgtgggtgggt tcgtatgtt 2640  
aacgaagcggtt cgtcgaaatcc tgggtggccat cgtgggtgggt tcgtatgtt 2700  
gtgggtgttcatatccat cccgtggatg accaggatgc cattgtgttgcgtt gaaatgttcc 2760  
gcaactatgtt tccggcgat tttctgtgtt tttctgtgtt gtttccgtt gtttccgtt 2820  
ttttctccca tgaagacgtt acgatgttgcgtt gtttccgtt gtttccgtt gtttccgtt 2880  
agcaaatcgcc gctgttagcg gggccatcaa gtttctgtgtt gggccatcaa gtttctgtgtt 2940  
gctggcataa atatctcaact cgtcgatccat tttctgtgtt gtttccgtt gtttccgtt 3000  
ggagtgccat gtttccgtt gtttccgtt gtttccgtt gtttccgtt gtttccgtt 3060  
ctcgatgttgcgtt gtttccgtt gtttccgtt gtttccgtt gtttccgtt gtttccgtt 3120  
ccggcgatccat cgtcgatccat tttctgtgtt gtttccgtt gtttccgtt gtttccgtt 3180  
catgttataatccat cccgtggatg accaggatgc cattgtgttgcgtt gtttccgtt 3240

gctgggaccg cttgctgcaa ctctctcagg gccaggcggt gaagggaat cagctgtgc 3300  
 ccgtctcaact ggtaaaaaga aaaaccaccc tggcgcccaa tacgcaaacc gcctctcccc 3360  
 gccgttggc cgattcatta atgcagctgg cacacaggt ttcccgactg gaaagcgccc 3420  
 atgagcgca acgcaattaa tctaagttag ctcaactcatt aggcacccca ggctttacac 3480  
 ttatgcttc cggctcgat ggcgttccgg tgcgtacggt gaaaacctct gacacatgca 3540  
 gctcccgag acggtcacag cttgtctgta agggatgcc gggagcagac aagcccgta 3600  
 gggcgcgtca gcgggttggc gcgggtgtcg gggcgccagc atgacccagt cacgtacgca 3660  
 tagcggagtg tatactggct taactatgca gcatcagagc agattgtact gagagtgcac 3720  
 cattatgcgg tgcgtaaatac cgcacagatg cgtaaggaga aaataccgca tcaggcgctc 3780  
 ttccgcttcc tcgctcaactg actcgctgca ctccgtcggt cggctcgcc gagggtatc 3840  
 agctcaactca aaggcgtaa tacggttatc cacagaatca ggggataacg cagggaaaga 3900  
 catgtgagca aaaggccagc aaaaggccag gaaccgtaaa aaggcccggt tgctggcggt 3960  
 ttccatagg ctccgcccccc ctgacgagca tcacaaaaat cgacgctcaa gtcagagggt 4020  
 gcaaaccgg acaggactat aaagatacca ggcgtttccc cctggaaact ccctcggtcg 4080  
 ctccctgtt ccgaccctgc cgcttacgg atacctgtcc gccttctcc cttcgccaaag 4140  
 cttggcgctt tctcatagct cacgctgttag gtatctcagt tcgggttagg tcgttcgctc 4200  
 caagctgggc tgcgtgcacg aaccccccgt tcagccgac cgctgcgcct tatccggtaa 4260  
 ctatcgctt gatccaaacc cgtaagaca cgacttatcg ccactggcag cagccactgg 4320  
 taacaggatt agcagagcga ggtatgttagg cggtgctaca gagttcttga agtggggcc 4380  
 taactacggc tacactagaa ggacagtatt tggatctgc gctctgctga agccagttac 4440  
 ctccggaaaa agagttggta gctcttgatc cggcaaaacaa accaccgctg gtagcggtgg 4500  
 ttttttggt tgcagcgc agattacgcg cagaaaaaaa ggatctcaag aagatcctt 4560  
 gatctttct acggggctcg acgctcaactg gaaacggaaaac tcacgttaag ggatcttgc 4620  
 catgagatta tcaaaaaagga tcttcaccta gatcctttta aattaaaaat gaagttttaa 4680  
 atcaatctaa agtatataatg agtaaacttgc gtctgacagt taccaatgtc taatcgtga 4740  
 ggcacctatc tcagcgatct gtctatttcg ttcatccata gttgcgtgac tccccgtcg 4800  
 gtagataact acgatacggg agggcttacc atctggccccc agtgcgtcaa tgataccgcg 4860  
 agacccacgc tcaccggctc cagatttatac agcaataaaac cagccagccg gaagggccga 4920  
 gccgcagaagt ggtccgtcaa ctttatccgc ctccatccag tcttattaaatt gttgcgggaa 4980  
 agctagagta agtagttcgc cagttaatag tttgcgcac gttgttgcca ttgctgcag 5039

<210> 3  
 <211> 6209  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Custom DNA vector

<400> 3

gcatcggtt gtcacgctcg tcgtttggta tggcttcatt cagctccggc tcccaacgat 60  
 caaggcgagt tacatgatcc cccatgttgt gcaaaaaaagc gttagctcc ttccgtcctc 120  
 cgatcggggg gggggggaaa gccacgttgt gtctcaaaat ctctgtatgtt acattgcaca 180  
 agataaaaaat atatcatcat gaacaataaa actgtctgtc tacataaaaca gtaataacaag 240  
 ggggtttatg agccatattc aacgggaaac gtcttgcctc aggcccgat taaattccaa 300  
 catggatgtc gatttatatg ggtataaatttgc ggctcgcat aatgtcgccg aatcaggtgc 360  
 gacaatctat cgactgtatg ggaagcccgat tgcggccagag ttgtttctga aacatggcaa 420  
 agtagcggtt gccaatgtatg ttacagatga gatggtcaga ctaaactggc tgacggaaatt 480  
 tatgcctctt ccgaccatca agcattttt ccgtactcct gatgtatgc gttactcac 540  
 cactgcgatc cccggggaaa cagcattcca ggtatttagaa gaatatcctg attcaggtga 600  
 aaatattgtt gatgcgtctgg cagtgttcc tgcggcggtt cattcgattt ctgtttgtaa 660  
 ttgtccctttt aacagcgatc gcgttatttcg tctcgctcag ggcgaatcactc gaaatgaataa 720  
 cggtttgggtt gatgcgtatg atttgtatg cggcgtaat ggctggctg ttgaacaagt 780  
 ctggaaagaa atgcataagc tattgcccatt ctcaccggat tcaagtgc tca ctcattgtga 840  
 ttctcactt gataacccat ttttgcacgat gggaaattt ataggtgttgc ttgtatgttgg 900  
 acgagtcgga atcgcagacc gataccagga tcttgccatc ctatggaaact gcctcggtga 960  
 gtttctccct tcattacaga aacggctttt tcaaaaaat ggtattgtata atcctgatata 1020  
 gaataaattt cagtttccatt tgcgtacgat tgcgtttttc taaagtacta ctcttccttt 1080  
 ttcaatatta ttgaagcatt tatcagggtt attgtctcat gagcggatac atatttgaat 1140

gtatttagaa aaataaacaat ataggggttc cgccgcacatt tccccaaaaa gtgccacctg 1200  
 acgatgaaat tgtaaacgtt aatattttgt taaaattcgc gttaaatttt tgtaaatca 1260  
 gctcattttt taaccaatag gccgaaatcg gcaaaatccc ttataaatca aaagaatagc 1320  
 ccgagatagg gttgagtgtt gttccagttt ggaacaagag tccactatta aagaacgtgg 1380  
 actccaacgt caaaggcgaa aaaaccgtct atcagggcga tggcccacta cgtgaaccat 1440  
 cacccaaatc aagtttttg gggtcgaggt gccgtaaagc tctaaatcgg aaccctaaag 1500  
 ggagccccccg attttagagct tgacgggaa agccggcgaa cgtggcgaga aaggaaggaa 1560  
 agaaaagcgaa aggagcgggc gctagggcgc tggcaagtgt agcggtcacg ctgcgcgtaa 1620  
 ccaccacacc cgccgcgtt aatgcgcgc tacagggcgc gtactatgt tgcttgacg 1680  
 catcgtctaa gaaaccatta ttatcatgac attaacctat aaaaataggc gtatcacgag 1740  
 gcccattcgt cttcaagcag atctgaaaaa aaagcccgct cattaggcgg gctcagatct 1800  
 gctcatgtt gacagcttat catcgatgc gacggtaccg aattcctcga gtctagaaag 1860  
 cttagagctcg gatccgaatt ctgaaatcct tccctcgatc ccgagggtgt tgttattgtt 1920  
 atgttggttt ttgttcgagc tcgaattagt ctgcgcgtct ttcagggtt catcgacagt 1980  
 ctgacgaccg ctggcgccgt tgatcaccgc agtacgcacg gcataccaga aagcggacat 2040  
 ctgcgggatg ttggcatga tttcacctt ctggcggtt tccatagttt cggcaatacg 2100  
 tggatcttc gccaactctt cctcgtaaga cttcagcgct acggcaccca gcggtttgtc 2160  
 ttattaaacc gttccagac cttcatcaat cagcagatag tttcgagga actctttgc 2220  
 cagctcttg ttcggactgg cggcgtaat acctgcgtc agcacgcca cgaacgggtt 2280  
 ggtatgggtga cccttgaagg tcggcagttc cgttacacca taattcactt tgctgggtgc 2340  
 gatgttggac catgcccacg ggccgttgat ggtcatcgct gtttcgcctt tattaaagc 2400  
 agtttctgcg atggagtaat cggtgtctgc attcatgtt tggtttttaa tcaaggtaac 2460  
 caggaagggtc agaccgcgtt tcgcgcacgc gttatccacg cccacgttta taatgtcgt 2520  
 cttagccgtt tcataacttga acgcataacc cccgtcagca gcaatcagcg gccaggtgaa 2580  
 gtacggttct tgcaagggttga acatcagcgc gctcttacct ttgcgtttca gttcttatac 2640  
 cagcgccggg atctttccc aggttttgg cgggttcggc agcagatctt tgttataat 2700  
 cagcgataac gttcaacag cgatcggtt agcaatcago ttgcgttgc aacgtacgc 2760  
 atcccaggta aacggataca gcttgcctt gaaacgtttt tccgggggtga tttcagccaa 2820  
 caggccagat tgagcgttagc caccaaagcg gtcgtgtgcc cagaagataa tgcaggggcc 2880  
 atcgccagtt gccgcacactt gttggaaattt ctcttccagt ttatccggat gtcacacgt 2940  
 gactttaattt ccggatctt tctcgaattt cttaccgact tcagcgagac cgttatagcc 3000  
 ttatcgccg ttaatccaga ttaccagttt accttcttgc attttcatat gacccctaa 3060  
 gcatcgatag atcctgtttc ctgtgtgaaa ttgttacccg ctcacaattt cacacattt 3120  
 acgagccgat gattaattgt caacaggggg atggggagta agctgatctt gttcctgtg 3180  
 tgaatttggatcccgctac aattccacac attatacgag ccgatgatta attgtcaaca 3240  
 gggggatggg gagtaagctc atcgatggat cgatcctgtt tcctgtgtga aattgttatac 3300  
 cgctcacaat tccacacatt atacgaggccg gaacgataaa gtgtaaagcc tggggtgct 3360  
 aatgagttagt ctaacttaca ttaattcggt tgccgtact gcccgttcc cagtcgggaa 3420  
 acctgtcggt ccaggacacc atcgaatggt gcaaaacctt tcgcgttgc gcatgatagc 3480  
 gcccggaaaga gagtcattt cgggtggta atgtgaaacc agtaacgtt tacatgtcg 3540  
 cagagtatgc cggtgtctct tatcagaccg tttcccgctt ggtgaaccag gccagccacg 3600  
 ttctcgaa aacgcgggaa aaagtggaa cggcgatggc ggagctgaat tacattccca 3660  
 acccgctggc acaacaactg gcccccaac agtcgttgc gattggcgat gccacctca 3720  
 gtcgtggccct gcacgcgcgc tcgcaattt tcgcggcgat taaatctcgc gccgatcaac 3780  
 tgggtggccag cgtgggtggtgc tgatggtag aacaagcggt cgtcgaagcc tgtaaagcg 3840  
 cggtgccacaa tcttcgtcgca caacgcgtca gtgggtgtat cattaactat cccgtggatg 3900  
 accaggatgc cattgtgtgc gaagctgcct gcactaatgt tccggcgat tttcttgc 3960  
 tctctgacca gacacccatc aacagtattt tttctccca tgaagacggt acgcgactgg 4020  
 gcggtggagca tctggtcgc tgggtcacc agcaaatcgc gctgttagcg gcccattaa 4080  
 gttctgtctc ggcgcgtctc cgtctggctg gctggcataa atatctcact cgcaatcaaa 4140  
 ttctcgat agcggaaacgg gaaggcgact ggagtgcct gtcgggtttt caacaaacca 4200  
 tgcaaatgtc gaatgagggtc atcgatccca ctgcgtatgc gttgcacac gatcagatgg 4260  
 cgctggcgcc aatgcgcgc attaccgat cccggctgcg cgtgggtgcg gatatactcg 4320  
 tagtgggata cgacgatacc gaagacagct catgttatac cccggcgatc accaccatca 4380  
 aacaggattt tcgcctgtc gggcaaaacca gcgtggaccg ttgcgtcgaat ctctctcagg 4440  
 gcccgggtt gaaggcgat cagctgtgc cggctact ggtaaaaaga aaaaccaccc 4500  
 tggcgcccaa tacgcaaaacc gcctctcccc ggcgttggc cgattcatta atgcagatgg 4560  
 cacgacaggt ttcccgactg gaaaggcgcc agtggagcgca acgcaattaa tgaagttag 4620  
 ctcaacttacc aggcacccca ggcttacac tttatgttcc cggctcgat ggcgtttcgg 4680  
 tgatgacggt gaaaacctct gacacatgca gctcccgag acggtcacag cttgtctgt 4740  
 agcgatgcc gggagcagac aagccgtca gggcggtca gcggtgttgc gcggtgtc 4800

gggcgcagcc atgacccagt cacgtagcga tagcggagtg tatactggct taactatgcg 4860  
 gcatcagagc agattgtact gagagtgcac cattatgcgg tgtgaaatac cgcacagatg 4920  
 cgtaggaga aaataccgca tcaggcgctc ttccgcttcc tcgctcactg actcgctgcg 4980  
 ctcggtcgtt cggctgcggc gagcggatc agtcactca aaggcggtaa tacggttatc 5040  
 cacagaatca ggggataacg cagggaaagaa catgtgagca aaaggccagc aaaaggccag 5100  
 gaaccgtaaa aaggccggt tgctggcggtt tttccatagg ctccggccccc ctgacgagca 5160  
 tcacaaaaat cgacgctcaa gtcagaggtg gcgaaaccccg acaggactat aaagatacca 5220  
 ggcgttccc cctggaaagct ccctcgtcg ctctcctgtt ccgaccctgc cgcttaccgg 5280  
 atacctgtcc gccttctcc ctgcggaaag cgtggcgctt tctcatagct cacgctgttag 5340  
 gtatctcagt tcgggtgtagg tcgttcgctc caagctggc tggcgtgcacg aaccccccgt 5400  
 tcagccgcac cgctgcgcct tatccgtaa ctatcgtctt gagtccaaacc cggtaagaca 5460  
 cgacttatcg ccactggcag cagccactgg taacaggatt agcagagcga ggtatgttagg 5520  
 cggtgctaca gagttctga agtggtgcc taactacggc tacactagaa ggacagtatt 5580  
 tggtatctgc gctctgctga agccagttac cttcgaaaaa agagttggta gctcttgatc 5640  
 cggcaaacaa accaccgctg gtagcgggg ttttttttt tgcaagcagc agattacgcg 5700  
 cagaaaaaaaaa ggatctcaag aagatccctt gatctttct acggggctcg acgctcagt 5760  
 gaacgaaaac tcacgttaag ggattttgtt catgagatta tcaaaaagga tcttcaccta 5820  
 gatcctttta aattaaaaat gaagttttaa atcaatctaa agtatatacg agtaaactg 5880  
 gtcgtacagt taccaatgct taatcagtga ggcaccttac tcagcgatct gtctatttcg 5940  
 ttcatccata gttgcctgac tccccgtcg gtatgataact acgatacggg agggcttacc 6000  
 atctggcccc agtgcgtcaa tgataccgcg agacccacgc tcaccggctc cagatttac 6060  
 agcaataaaac cagccagccg gaagggccga gcgcagaagt ggtcctgcaa ctttatccgc 6120  
 ctccatccag tctattaatt gttgccggga agctagagta agtagttcgc cagtaatacg 6180  
 tttgcgcaac gttgttgcca ttgctgcag 6209

✓  
 <210> 4  
 <211> 29  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> 5' modified restriction site

<400> 4  
 attccaattc gatcgggggg ggggggaaa

29

<210> 5  
 <211> 31  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> 3' modified restriction site

<400> 5  
 attccaagta gtactttaga aaaactcatc g

31

<210> 6  
 <211> 83  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> 5' modified multiple cloning site

<400> 6  
 atcgatcgac atatgggatc cgagctcaag ctttctagac tcgaggaatt cggtaccgtc 60  
 gacatcgatg ataagctgtc aaa

83

```

<210> 7
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> 3' modified multiple cloning site

<400> 7
attccaagta gtactactct tccttttca a 31

<210> 8
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> 5' PCR primer for pcWIN2 construct

<400> 8
caattatata gatctatcga tgcttaggag gt 32

<210> 9
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> 3' PCR primer for pcWIN2 construct

<400> 9
ttgccttatt ctagatcatt agtggtgatg gtggtg 36

<210> 10
<211> 6659
<212> DNA
<213> Artificial Sequence

<220>
<223> Custom DNA vector pMS39

<400> 10
tcgccttccc gttccgctat cggctgaatt tgattgcag tgagatattt atgccagcca 60
gccagacgca gacgcgcccga gacagaacctt aatggggcccg ctaacagcgc gatttgctgg 120
tgacccaatg cgaccagatg ctccacgccc agtgcgcgtac cgtcttcatg ggagaaaata 180
atactgttga tgggtgtctg gtcagagaca tcaagaata acgcccgaac attagtgcag 240
gcagcttcca cagcaatggc atcctggtca tccagcggat agttaatgtat cagcccactg 300
acgcgttgcg cgagaagatt gtgcaccgccc gctttacagg cttcgacgccc gcttcgttct 360
accatcgaca ccaccacgct ggcaccccaatg tgatcggcgc gagattaat cgccgcgaca 420
atttgcacg ggcgcgtgcg ggcaccaatg gaggtggcaa cgccaaatcag caacgcactgt 480
ttgcccgcga gttgtgtgc cacgcgggtt ggaatgtat ttagctccgc catcgccgct 540
tccactttt ccccggtttt cgcagaaacg tggctggcct ggttaccac gcccggaaacg 600
gtctgataag agacacccggc atactctgcg acatcgata acgttactgg tttcacattc 660
accaccctga attgactctc ttccggggcgc tatacatgcca taccgcgaaa ggttttgcac 720
catcgatgg tgccttggca cgacagggtt cccgactggaa aagcgggcag tgagcgcaac 780
gcaattaatg taagtttagct cactcattag gcaccccaagg cttagtactt tatgcttccg 840
gctcgataaa tgtgtggaaat tggagcgga taacaatttc acacagaaa caggatcgat 900
ccatcgatga gcttactccc catccccctg ttgacaattt atcatcggtt cgtataatgt 960
gtggaaattgt gagcggataa caatttcaca caggaaacag gatcagctt cttccatcc 1020
ccctgttgac aattaatcat cggctcgat aatgtgtgga attgtgagcg gataacaattt 1080
tcacacagga aacaggatct atcgatgctt aggaggtcat atgaaaatcg aagaaggtaa 1140

```

actggtaatc tggattaacg gcgataaaagg ctataacggc ctcgctgaag tcggtaaaga 1200  
atcgagaaa gataccggaa taaaagtac cggtgagcat ccggataaaac tggaaagagaa 1260  
attcccacag gttgcggaa ctggcgatgg ccctgacatt atcttctggg cacacgaccc 1320  
ctttgggtggc tacgctcaat ctggcctgtt ggctgaaatc acccoggaca aagcggttcca 1380  
ggacaagctg tatccgttta cctggatgc cgtacggtac aacggcaagc tgattgtcta 1440  
cccgatcgct gttgaagcgt tatecgctgat ttataacaaa gatctgctgc cgaacccggcc 1500  
aaaaaacctgg gaagagatcc cggcgctgga taaaagaactg aaagcgaaag gtaagagcgc 1560  
gctgatgttc aacctgcaag aaccgtactt cacctggccg ctgattgtcgt ctgacggggg 1620  
ttatgcgttc aagtatgaaa acggcaagta cgacattaaa gacgtggcg tggataacgc 1680  
tggcgcgaaa gcgggtctga ctttctgtt tgacctgatt aaaaacaaac acatgaatgc 1740  
agacaccgat tactccatcg cagaagctgc ctttaataaa ggcgaaacag cgatgaccat 1800  
caacggcccc tgggcgttgc ccaacatcgaa caccagcaaa gtgaattatg gtgtaacggt 1860  
actgcccggacc ttcaagggtc aaccatccaa accgttcgtt ggcgtgtca ggcgcaggat 1920  
taacgcccggc agtccgaaca aagagctggc aaaagaggtt ctcgaaactt atctgtgtac 1980  
tgcgttgcgg ttaataaaaga caaaccgtg ggtgcgttag cgctgaagtc 2040  
ttacgaggaa gagttggcga aagatccacg tattggccgact acatggaaa acgcccggaa 2100  
aggtgaaatc atgcccgaaca tcccgcagat gtccgctttc tggatgtccg tgcgtactgc 2160  
gttgcataac gcccggcagcg gtcgtcagac tgcgtatgaa gccctgaaag acgcgcagac 2220  
taattcgagc tcgaacaaca acaacaataa caataacaac aacctcgggg tcgagggaag 2280  
gatttcagaa ttcgatcta ttgtggcgc cggcggcacc accaccaccc cgaccccccac 2340  
cggtccggc agcgtgaccc cgaccagcaaa aaccacccggc accgcgcagca aaaccacgcac 2400  
cagcacctca tcaacccttcgtt accacccccc gaccgggtg gcggtgaccc tcgatctgc 2460  
cgccgaccacc acctacggcg aaaacatcta cctgggtggc tcgatcttc agctgggtga 2520  
ttgggaaacc agcgatggca ttgcgttgcg cgccgataaa tacaccccca gcgatccgct 2580  
gtggatgttgc accgtgaccc tggccggggg tgaatgtttt gaatacaat ttatccgcac 2640  
tggaaagcgat gattccgtgg aatggggaaag cgatccgaaac cgcaatacaca ccgtgcccga 2700  
ggcgtccggc acctcgaccg cgaccgtgcg cgatacctgg cgccgatccg agctcaagct 2760  
ttcttagactc gaggaatttcg gtaccgtcga catcgatgtat aagctgtcaa acatgagcag 2820  
atctgagccc gcctaatgag cgggtttttt tttcagatct gcttgaagac gaaagggcct 2880  
cgtgatacgc ctatTTTt aggttaatgt catgataata atggtttctt agacgtatgc 2940  
tcaaagcaac catagtagcgc gcccctgttagc ggccgtttaa ggcgcggcggg tttgggtgtt 3000  
acgcgcagcg tgaccgctac acttggccagc gcccctagcgc ccgctccctt cgcttcttc 3060  
ccttccttcc tgcacccgtt cggccggctt ccccgtaag ctctaaatcg ggggctccct 3120  
ttagggttcc gatttagagc tttacggcac ctgcacccca aaaaacttga tttgggtgt 3180  
ggtcacgtt gtggggccatc gcccctgtatc acggtttttcc gccccttgac gttggagttcc 3240  
acgttcttta atagtgact cttgttccaa acttggaaacaa cactcaaccc tatctcgcc 3300  
tattcttttgc atttataagg gattttggcg atttcggccctt attggttaaa aaatgagctg 3360  
attnaacaat aatttacgc gaattttaaac aaaaatattaa cgtttacaat ttcatcgta 3420  
ggtggcactt ttccggggaaa tgcgtccggc acccctattt gtttattttt ctaatacat 3480  
tcaaataatgt atccgctcat gagacaataa ccctgataaa tgcttcaata atattgaaaa 3540  
aggaagagta gtactttaga aaaactcattc gagcatcaaa tgaaactgca atttattcat 3600  
atcaggatttcaataccat attttggaaa aaggccgttgc tgtaatgaag gagaacttc 3660  
accgaggccat ttccatagga tggcaagatc ctggatcccg tctgcgattc cgactcgtcc 3720  
aacatcaata caacccatattt atttcccttc gtccaaataa aggttatcaa gtgagaaatc 3780  
accatgagtg acgactgaat ccgggtgagaa tggcaatagc ttatgcattt ctttcccgac 3840  
ttgttcaaca ggcctggccat tacgctcgatc atccaaatca ctgcgttcaaa ccaaccgtt 3900  
attcattcgat gattggccctt gagcgagacg aaatacgcga tcgctgtttaa aaggacaatt 3960  
acaaacaggg atcgaatgca accggccgcg gaacactgtcc acgcgtatcaa caatattttc 4020  
acctgttgc ggttatttttcaataccat gatgtgttgc ttccggggg tcgcgttgc 4080  
gagtaaccat gcatcatcgat gatgtgttgcgat aaaaatgttgc tgatgttgcgaa gaggcataaa 4140  
ttccgtcagc cagtttagtc tgaccatctc atctgttaca tcattggcaat cgcttccctt 4200  
ggccatgtttc agaaacaaact ctggcgatc gggcttccca tacagtgcgtt agattgtcgc 4260  
acctgttgc cccgacattat ccggagccca ttataccatcataaaatcg catccatgtt 4320  
ggaaatattat ccggccctgg agcaagacgt ttccctgttgc atatggctca taacaccctt 4380  
tgttattactg ttatgttgcgat cagacatgtt tattgttgcgtt gatgtatata ttttattctt 4440  
tgcaatgttgc catcgatgtt ttttgcgttgc aacatggggg atcatgttgc acgttgc 4500  
ggaccggagg agctaaccgc ttttttgcac aacatggggg atcatgttgc acgttgc 4560  
cgttggaaac cggagctgaa tgaaggccata ccaacacgcg acgttgcacac cacgtgcct 4620  
gcagcaatgg caacaacgtt ggcggaaacta ttaactggcg aactacttac tctagcttcc 4680  
cgcccaataat taatagactg gatggggcg gataaaatgtt caggaccact tctgcgttgc 4740  
cccttcggcc ctggctggat tattgttgcgtt aaatctggat ccgggtgagcg tgggtctcgc 4800

ggtatcattt cagcactggg gccagatgg aagccctccc gtatcgtagt tatctacacg 4860  
 acggggagtc aggcaactat ggtatgaacga aatagacaga tcgctgagat aggtgcctca 4920  
 ctgattaagc attggtaact gtcagaccaa gtttactcat atatacttta gattgattta 4980  
 aaacttcatt tttaatttaa aaggatctag gtgaagatcc tttttgataa tctcatgacc 5040  
 aaaatccctt aacgtgagtt ttcgttccac tgagcgttag accccgtaga aaagatcaaa 5100  
 ggtatcttctt gagatccttt ttttctgcgc gtaatctgct gcttgcacaa aaaaaaacc 5160  
 ccgcttaccag cgggtggttt actggcttca gcagagcgca gataccaaat actgtccttc tagttagcc gtagttagc 5280  
 caccacttca agaactctgt agcaccgcct acatcacctcg ctctgtaat cctgttacca 5340  
 gtggctgctt ccagtgccga taagtcgtt cttaccgggt tggactcaag acgatagta 5400  
 ccggataagg cgcagcggtc gggctgaacg gggggttcgt gcacacagcc cagcttggag 5460  
 cgaacgacact acaccgaact gagataaccta cagcgtgagc tatgagaaag cgccacgctt 5520  
 cccgaaggga gaaaggcgga caggtatccg gtaagcggca gggtcggaa aggagagcgc 5580  
 acgaggggagc ttccaggggg aaacgcctgg tatctttata gtcctgtcgg gtttcggccac 5640  
 ctctgacttg agcgtcgatt tttgtatgc tcgtcagggg ggcggagcct atggaaaaac 5700  
 gccagcaacg cggcctttt acggttcctg gccttttgc ggcctttgc tcacatgttc 5760  
 tttcctgcgt tatcccctga ttctgttgat aaccgtatta ccgccttga gtgagctgat 5820  
 accgctcgcc gcagccgaac gaccgagcgc agcgagtcag tgagcggaga agcggaaagag 5880  
 cgcctgtatgc ggtatttct ccttacgcattt ctgtcggta tttcacaccg cataatggtg 5940  
 cactctcagt acaatctgtt ctgtatgcgc atagttaaagc cagttatcac tccgctatcg 6000  
 ctacgtgact gggtcatggc tgcccccga caccgccaa caccgcgttgc cgcgcctgt 6060  
 cgggcttgcgc tgctcccgcc atccgcattt acacaagctg tgaccgtctc cgggagctgc 6120  
 atgtgtcaga ggttttccacc gtcatcacccg aaacgcctata cgagccggaa gcataaaagt 6180  
 taaaggcttgg ggtgcctaat gagtgagcta acttacattt attgcgttgc gctcaactg 6240  
 cgcttccag tcgggaaacc tgtcgtgcca gctgcattaa tgaatcgcc aacgcgcggg 6300  
 gagaggcggt ttgcgttattt ggcgcgggg tggttttct tttcaccaggat gagacgggca 6360  
 acagctgatt gcccttccacc gcctggccct gagagagttt cagcaagcgg tccacgctgg 6420  
 tttgccccag caggcgaaaa ttctgttga tgggtttaa cggcgggata taacatgagc 6480  
 tgtcttcgggt atcgtcgat cccactaccc agatatccgc accaacgcgc agcccgact 6540  
 cggtaatggc gcgcatttgc cccagcgcc tctgatcggtt ggcaaccaggc atcgcagttt 6600  
 gaacgatgcc ctcattcagc atttgcattttt gtttgcattttt accggacatg gcactccag 6659

<210> 11  
 <211> 6647  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Custom DNA vector pMXS39

<400> 11  
 tcttttccacc agtgagacgg gcaacagctt attgccttc accgcctggc cctgagagag 60  
 ttgcagcaag cggccacgc tgggttgcacc cagcaggcga aaatccgtt tgatgggtgt 120  
 taacggcggtt atataacatg agctgtttc ggtatcgatc tatcccaacta ccgagatatc 180  
 cgcaccaacg cgcagcccg actcggttac ggcgcgttgc cgcgcacgc ccatctgtatc 240  
 gttggcaacc agcatcgatc tggaaacat ggccttcattt agcatttgc tggtttgcgt 300  
 aaaaccggac atggacttcc agtcgccttc ccgttccgtt atcggcttgc tttgatttgc 360  
 agtgagatattt atatgccacc cagccagacg cagacgcgcg gagacagaac ttaatgggg 420  
 cgctaacacg gcgttgcgtt ggtgaccatc tgccggccatc tgctccacgc ccagtcgcgt 480  
 accgttccatc tgggagaaaa taatactgtt gatgggtgtc tggtcagaga catcaagaaa 540  
 taacggcggtt acattatgtc agggcgttcc cacagcaatg gcatctgttgc catccagcgg 600  
 atagttatgtt atcagccac tgcgcgttgc cgcgagaaga ttgtgcaccgc cgccttaca 660  
 ggcttcgcacgc cgccttcgtt ctaccatcgatc caccaccacgc ctggcaccatc gttgatcg 720  
 gogagattta atcgccgcga caatttgcga cggcgcgtgc agggccacgc tggaggtggc 780  
 aacgcacatc agcaacgcact gtttgcgc cagttgttgc gccacgcgtt gggaaatgt 840  
 attcagctcc gccatcgccgc cttccactt ttccgcgtt ttcgcagaaa cgtggctgc 900  
 ctggttcacc acgcggggaaa cggtctgata agagacaccgc gcataactctgc cgacatcgatc 960  
 taacgttact ggtttcacat tcaccaccctt gaattgactc tcttccgggc gctatcatgc 1020  
 cataccgcga aaggttttgc accattcgat ggtgtccctgg cacgacaggt ttccgcactg 1080

gaaaggccgc agtgagcgc acgcaattaa tgtaagtttag ctcaactcatt aggcacccca 1140  
ggctttacac ttatgcttc cggctcgat aatgtgtgga atttgagcg gataacaatt 1200  
tcacacagga aacaggatcg atccatcgat gagcttactc cccatcccc tgttgacaat 1260  
taatcatcggt ctcgtataat gtgtggaatt gtgagggat aacaatttca cacagaaac 1320  
aggatcagct tactccccat cccctgttg acaattaatc atcggctcgat ataatgtgtg 1380  
gaattgttag cggtataacaa tttcacacag gaaacaggt ctatcgatgc ttaggaggc 1440  
atataaaaaat cgaagaaggtaa aactggtaa tctggattaa cggcgataaa ggctataacg 1500  
gtctcgctga agtcgtaaag aaattcgaga aagataccgg aattaaagtc accgttgagc 1560  
atccggataa actggaaagag aaattccac aggttgcggc aactggcgat ggccctgaca 1620  
ttatctctg ggcacacgac cgcttggta gctacgctca atctggctg ttggctgaaa 1680  
tcaccccgga caaagcgttc caggacaagc tttatccgtt tacctggat gccgtacgtt 1740  
acaacggcaa gtcgttgcgt taccggatcg aagatctgct gcccgaacccg ccaaaaacct 1800  
tggaaagcgaa aggtaaagagc gcgctgatgt gggaaagagat cccggcgctg gataaagaac 1860  
cgctgattgc tgctgacggg gttatcggt tcaacctgca agaaccgtac ttacacctggc 1920  
aagacgtggg cttggataaac gctggcgcga tcaagtatga aaacggcaag tacgacatta 1980  
ttggcgtgtc gagcgcaggat attaacgccc aaggcgaaac agcgatgacc atcaacggcc 2040  
ccactatggaa aacacatgaat gcagacaccg aagtgaatta tgggtgtaaacg gtactgccc 2100  
ttggcgtgtc gagcgcaggat attaacgccc tctcgaaaa ctatctgctg actgtatgaag cgtggcatg gtcacacatc gacaccagca 2160  
ccactatggaa aacacatgaat gcagacaccg aagtgaatta tgggtgtaaacg gtactgccc 2220  
tctggatgc cttggctact gcggtatca ccagtccgaa caaagagctg gcaaaagagt 2280  
aaggccctgaa agacgcgcag actaattcga gctcgaaacaa caacaacaat aacaataaca 2340  
acaacccctgg gatcgaggga aggatttcag aagagtggc gaaagatcca cgtattgccc 2400  
tcgagattgt ggcgacccggc ggcaccacca tcatgcccggaa catcccgacg atgtccgtt 2460  
tgaccctcgac cttggctact gcggtatca acgcccgcacg cggctcgatc actgtcgatg 2520  
acggcgaaaa catctacctg gtgggctcga gctcgaaacaa caacaacaat aacaataaca 2580  
atggcattgc gotgagcgcg gataaaataca tctctcgatc gggtattgg gaaaccagcg 2640  
tgaccctgccc ggcgggtgaa tctttgatcc cttccagcga tccgctgtgg tatgtgaccg 2700  
ccgtggaatg ggaaaagcgat ccgaaccgcg ctagtgcgac cccgaccggc tccggcagcg 2760  
cgaccgcac cttggctact gcggtatca acatgagcag atctgagccc gcctaattgag ctagcattttt tttcagatct gcttgaagac 2820  
gaaaggccct cttggctact gcttgcgttcc gatggatcgat aaaaattttt ccgcatttgcgatc gggcatttgcg 2880  
agacgtgcg taaaagcaac catagtcgc tcttcattttt ggttgcgttcc gatggatcgatc gggcatttgcg 2940  
tctgggtgtt acgcgcagcg tgaccgcctac cttccatccatc gatggatcgatc gggcatttgcg 3000  
cgctttcttc cttccatccatc tccgcacgtt cttccatccatc gatggatcgatc gggcatttgcg 3060  
ggggctccct ttagggttcc gatggatcgatc aatacccgat ggcgcaggcg tgcggcacct 3120  
tttgggtgtt gttcacgtt gatggatcgatc aatgagtcga catcgatgtatc aagctgtcaa 3180  
gttggatcc acgttccatccatc cttccatccatc gatggatcgatc gggcatttgcg 3240  
atggcattgc gatggatcgatc aggttaatgt catgataata atggtttctt 3300  
tctggatcc acgttccatccatc gatggatcgatc gggcatttgcg 3360  
cgccggctttt cttccatccatc gatggatcgatc gggcatttgcg 3420  
tttacggcac cttccatccatc gatggatcgatc gggcatttgcg 3480  
tttgggtgtt gttcacgtt gatggatcgatc gatggatcgatc gggcatttgcg 3540  
gttggatcc acgttccatccatc gatggatcgatc gggcatttgcg 3600  
tatctcggtc tttccatccatc gatggatcgatc gatggatcgatc gggcatttgcg 3660  
ggggctccct ttagggttcc gatggatcgatc gatggatcgatc gggcatttgcg 3720  
tttgggtgtt gttcacgtt gatggatcgatc gatggatcgatc gggcatttgcg 3780  
gttggatcc acgttccatccatc gatggatcgatc gatggatcgatc gggcatttgcg 3840  
aaatgagctg atttaacaaa aatttaacgc gatggatcgatc gatggatcgatc gggcatttgcg 3900  
ttcatcgatc ggtggactt ttcggggaaa gatggatcgatc gatggatcgatc gggcatttgcg 3960  
ctaaatatacat taaaatatgt atccgctcat gatggatcgatc gatggatcgatc gggcatttgcg 4020  
atattgaaaa aggaagagta gtactttaga gatggatcgatc gatggatcgatc gggcatttgcg 4080  
atttattcat atcaggatta tcaataccat gatggatcgatc gatggatcgatc gggcatttgcg 4140  
gagaaaactc accgaggcgat ttccatagga gatggatcgatc gatggatcgatc gggcatttgcg 4200  
cgactcgatcc aacatcaata caaccattaa gatggatcgatc gatggatcgatc gggcatttgcg 4260  
gtgagaaatc accatgagtg acgactgaat gatggatcgatc gatggatcgatc gggcatttgcg 4320  
ctttccatccatc ttagggttcc gatggatcgatc gatggatcgatc gggcatttgcg 4380  
ccaaaccgtt attcattcgat gatggatcgatc gatggatcgatc gggcatttgcg 4440  
aaggacaattt acaaacagga atcgaatgc gatggatcgatc gatggatcgatc gggcatttgcg 4500  
caatatttccatccatc acctgaatca gatggatcgatc gatggatcgatc gggcatttgcg 4560  
tcgcagttt gatggatcgatc gatggatcgatc gatggatcgatc gggcatttgcg 4620  
gaggcataaaa ttccgtcagc ctttttttccatccatc acgtttagtc gatggatcgatc gatggatcgatc gggcatttgcg 4680  
cgctacccctt gccatgtttt agaaacaact gatggatcgatc gatggatcgatc gggcatttgcg 4740  
agattgtcgatc acctgattgc cccgacattat gatggatcgatc gatggatcgatc gggcatttgcg 4800  
catccatgtt ggaatttaat cgcggcttccatccatc acgtttagtc gatggatcgatc gatggatcgatc gggcatttgcg 4860  
taacaccctt tttatgttcaat gatggatcgatc gatggatcgatc gggcatttgcg 4920

tttatcttgc tgcaatgtaa catcagagat tttgagacac aacgtggcct tccccccccc 4800  
cccgatcgga ggaccgaagg agctaaccgc tttttgcac aacatgggg atcatgtaa 4860  
tcgcctgtat cgttggaaac cggagctgaa tgaagccata ccaaacgac agcgtgacac 4920  
cacgatgcct gcagcaatgg caacaacgtt gcgaaacta ttaactggcg aactactac 4980  
tctagcttcc cggcaacaat taatagactg gatggaggcg gataaagtgc caggaccac 5040  
tctgcgtcg gcccgtccgg ctggctggtt tattgctgat aaatctggag ccggtagc 5100  
tgggtctcgc ggtatcattt cagcactggg gccagatgtt aagccctccc gtatcgtag 5160  
tatctacacg acggggagtc aggcaactat ggtatgaacga aatagacaga tcgctgagat 5220  
agggtgcctca ctgattaagc attgttaact gtcagaccaa gtttactcat atatacttta 5280  
gattgattt aaacttcattt ttaattttaa aaggatctag gtgaagatcc tttttgataa 5340  
tctcatgacc aaaatccctt aacgtgagtt ttcgttccac tgacgtcag accccgtaga 5400  
aaagatcaaa ggtatcttctt gagatccttt ttttctgcgc gtaatctgct gcttgcac 5460  
aaaaaaacca ccgttaccag cgggtggttt gttgcccgtt caagagctac caactcttt 5520  
tccgaaggtt actggcttca gcagagcga gataccaaat actgtccttc tagttagcc 5580  
gtagtttaggc caccacttca agaactctgt agcaccgcct acataccctcg ctctgtaat 5640  
cctgttacca gtggctgctg ccagtgccga taagtctgtt cttaccgggt tggactcaag 5700  
acgatagttt ccggataagg cgcagcggc gggctgaacg gggggttcgt gcacacagcc 5760  
cagcttggag cgaacgaccc acaccgaact gagataccctt cagcgtgagc tatgagaaag 5820  
cccccacgctt cccgaaggga gaaaggcggaa caggtatccg gtaagcggca gggtcggaa 5880  
aggagagcgc acgaggggagc ttccaggggg aaacgcctgg tatcttata gtcctgtcgg 5940  
gtttccac ccctgtacttgc agcgtcgatt tttgtatgc tcgtcagggg ggcggagcct 6000  
atggaaaaac gccagcaacg cggcctttt acggttcctg gcctttgct ggcctttgc 6060  
tcacatgttc ttccctgcgt tatcccgtat ttctgtggat aaccgtattt ccgcctttga 6120  
gtgagctgat accgctcgcc gcagccgaac gaccgagcgc agcgagtca tgagcgagga 6180  
agcggaaagag ccctgtatgc ggtatttct ctttacgcat ctgtcggta ttccacaccg 6240  
cataatgttgc caactctcagt acaatctgct ctgtatgcgc atagttaaagc cagtatacac 6300  
tccgctatcg ctacgtgact gggtcatggc tgcccccga caccggccaa caccggctga 6360  
cgcgcctga cgggcttgc tgctccggc atccgcttac agacaagctg tgaccgtctc 6420  
cgggagctgc atgtgtcaga ggttttcacc gtcatcaccg aaacgccata cgagccggaa 6480  
gcataaagtgc taaagcctgg ggtgcctaat gagtgagcta acttacattt attgcgttgc 6540  
gctcaactgcc cgcttccag tcgggaaacc tgctgtgcca gctgcattaa tgaatcgcc 6600  
aacgcgcggg gagaggcggt ttgcgtattt ggcgcggg tggtttt 6647

```
<210> 12
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> 5' PCR primer for pCWin2-MBP-MCS-SBD (pMXS39)
      expression vector

<400> 12
tgtatccctcg agattgtggc gaccggcgac accac          35

<210> 13
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> 3' PCR primer for pCWin2-MBP-MCS-SBD (pMXS39)
      expression vector

<400> 13
aagcttgcgtc actcatttagc gccaggtatc ggtcacgg          38
```